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AUTHOR Herrmann, Andrea W.
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ABSTRACT

A review of the literature on computers and writing reveals that a dichotomy exists. The great debate that has been taking place in the world of writing instruction mirrors the emerging debate concerning the implementation of computers in education. Applications and research fall into one of two categories: the computer as a teaching instrument of the basic skills or the computer used in holistic ways as a writing tool. There seems to be reason for optimism about the teaching of writing, the role of the computer in that process, and the fact that the current interest in writing and computerized instruction may serve to create a new emphasis and new strategies in the art. Word processing is probably the most common way the computer is used holistically as a writing tool. Various studies done on computer assisted programs include Burns and Culp's experiment with a college freshman English group and Colette Daiute's studies on the effects of word processing with computers on children's writing. The question of how the composing process is affected using the computer is a complex one. Work in the area of computers and writing needs to take into account the ongoing research on the writing process, so that the best educational implementations of this new writing tool may be discovered. (DF)

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USING THE COMPUTER AS WRITING TEACHER: THE HEART OF THE GREAT DEBATES

Andrea W. Herrmann

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USING THE COMPUTER AS WRITING TEACHER: THE HEART OF THE GREAT DEBATES

Andrea W. Herrmann

The great debate which has been taking place in the world of writing instruction for some time mirrors the emerging debate concerning the implementation of computers in education. In the Great Writing Debate the central issue concerns whether writing can be taught through a mechanics-usage approach--grammar, punctuation, spelling--particularly via the manipulation of words and sentences, such as in workbook exercises, or whether writing instruction needs to rely primarily on the creation of written texts by the student, with mechanics and usage a by-product of the process, dealt with in relationship to the student's writing on an ad hoc basis. In the Great Computer Debate a war rages between the adherents of pre-programmed instruction--computer-assisted (CAI) and computer-managed (CMI) of the drill and practice and tutorial sort--versus those who advocate using the computer in more holistic ways with the student the creator or programmer of the activities.

The Great Writing Debate and the Great Computer Debate share a common philosophical foundation. The traditional grammar approach, like computer drill and practice, supports the underlying notion that isolating activities into classes makes them easier for students to understand, to learn, and to apply to the larger learning tasks. Opposition to these activities, however, suggests that they are mechanical, done rotely by students, and that information using these techniques is either poorly learned, irrelevant to more holistic tasks, not capable of being applied to new situations or that the segmentalization of steps fails to take into account the range of complex skills needed in the larger processes.

Seymour Papert, author of the best selling book, Mindstorms: Children, Computers and Powerful Ideas, sees the division as one between the computer as "teaching instrument" and the computer as "writing instrument" and states that "this difference is not a matter of a small and technical choice between two teaching strategies. It reflects a fundamental difference in educational philosophies." [1]

In looking over the literature on computers and writing, the existence of this dichotomy is striking. Applications and research fall into one or the other category: the computer as a teaching instrument of the basic skills or the computer used in holistic ways as a writing tool.

Basically two kinds of criticisms are made of computer-assisted programs. First is criticism that could be leveled at textbooks, namely that the content of the material about the

nature of writing and the writing process is of questionable value based on writing research. A corollary to this kind of criticism is that the computer is being used only as an expensive workbook; many programs essentially do nothing that couldn't be done as well on paper. Second are questions about the pedagogical approaches. They usually rest on the assumption that students should learn grammar before writing. They may assume that students who can put in the correct form of a verb, pick out the topic sentence in a paragraph or find the word that is incorrectly capitalized are learning how to write. In fact, while these are all useful editing skills, they do not help students acquire or improve their abilities in topic selection, focus, coherence, cohesion, the elaboration of ideas or any of the many other activities that involve the creation of written text.

The risk that confronts English teachers who turn to the typical CAI programs as a means of teaching writing is the same problem English teachers confront in the workbook orientation to teaching writing: the skills that are usually being taught are not writing but editing skills.

The belief that grammatical form should take precedence over meaning as the preferred way to create effective writing is greatly disputed by many writing theorists. James Collins, in "Speaking, Writing, and Teaching for Meaning," claims that students taught from this premise become effective in "error avoidance" and that their writing is brief, "vacuous and impersonal, polite and innocuous." [2] Anthony Petrosky deals with the issue of grammar in an article, "Grammar Instruction: What We Know." Based on a review of the literature, especially two carefully conducted longitudinal research studies carried out on the value of grammar instruction to writing improvement, he concludes that the study of grammar has no influence on the language growth of typical secondary students and that "there is no empirical evidence for the teaching of grammar for any purpose." [3]

A new model of the writing process has evolved as a result of the work by contemporary writing process theorists and researchers--Sondra Perl, Donald Murray, Donald Graves, Lucy Calkins, Janet Emig, Linda Flower and John Hayes, among others. They are exposing the fallacy that writing is a linear series of sequential steps proceeding from pre-writing to writing and then to revision. Methodologies and contexts for studies remain diverse and include the case studies of unskilled college writers by Perl, the use of laboratory protocol analysis of writers speaking into tape recorders as they write of Flower and Hayes, and the studies of children in schools by Graves and Calkins. However, they're discovering phenomena, to a great extent interrelated, that create a new and presumably more accurate view of the real nature of writing.

Perl describes it as a recursive, back and forth shuttling process. [4] She talks about it as one of "retrospective" and "projective structuring." [5] Flower and Hayes say,

> the writing process, like any other creative process, is rarely straightforward or direct. A writer's conclusions, his main ideas, even his focus, are often the product of searching, trial and error, and inference. [6]

They also point out the potentially negative influences of the parts-to-whole approach in teaching writing.

> This process could easily be disrupted by focusing on form too early. Thus a product-based plan may thwart the dynamics of the normal generating process by placing unnecessarily rigid constraints in the early stages of the writing process. [7]

Ample evidence exists to question approaches to writing whose principal concern lies within subskills--such as grammar, usage or form--rather than meaning and which draw their assumptions from the idealized model of the linear conception of the writing process that no longer appears valid. Emig makes a strong case for writing as a "unique mode of learning" and shows it to be organic and functional, a way of making learning connective and selective. [8] One of the dangers of time spent in inneffective ways of teaching writing is noted by Petrosky in his final evaluation of the role of grammar in teaching writing: "The study of grammar, while serving no ascertainable purpose, also exists at the expense of proficiency in reading and writing." [9] There is a fear, as Emig claims, that

> unless the losses to learners of not writing are compellingly described and substantiated by experimental and speculative research, writing itself as a central academic process may not long endure. [10]

Yet there seems reason to be optimistic about the teaching of writing, the role of the computer in that process, and, perhaps, even reason to believe that the current interest in writing and computerized instruction may serve to create a new emphasis and new strategies in that art. Recent approaches in the area of computers and writing have attempted to shift the focus from the computer as a teaching instrument to one where the student takes a more active role and the computer becomes a writing tool.

Word processing is probably the most common way the computer is used holistically as a writing tool. One of the important questions concerning this approach is how the use of computers affects the composing process. Is writing done on computers different from, perhaps superior to, written work done using other tools?

The question is legitimate. The current electronic age has given us a new sensitivity to the differences between the word as sound and as print. [11] According to Walter Ong, the word has been transformed in three stages: oral, script and electronic. [12] Jack Goody and Ian Watt take an in-depth look at the idea that "writing established a different kind of relationship between the word and its referent, a relationship that is more general and more abstract, and less closely connected with the particularities of person, place and time, than obtains in oral communication." [13] Ong also argues that, "more than any other single invention, writing has transformed human consciousness," by establishing "context-free" language as opposed to the embedded nature of oral discourse. If one accepts their argument that the means of production of thought, oral vs. literate, affects the nature of thought produced, then one may conclude that the different means of producing literate thought--pencil, typewriter, or word processor--could exert significant influence on the nature and quality of the written product.

If so, how might these differences manifest themselves? Writing done on a computer could affect the number and quality of ideas; the correctness of grammar, usage, and spelling; the choice of vocabulary; the complexity of syntax; style; and many other aspects of writing. Unfortunately there is as yet very little research evidence to indicate whether or not such effects do take place.

Burns and Culp have experimented in a Freshman English setting with a program that attempts to break away from the drill and practice format and to encourage students in "the process of exploring a subject to discover ideas, arguments, or propositions--those features which one must know in order to write convincingly about a subject." [14] Their conclusions state that their program encouraged both growth in the number and the sophistication of ideas." [15] This research did not involve the writing of compositions, only the generation of ideas on a topic the students had selected for a research paper. It did not evaluate the number and sophistication of ideas actually used by the students in the eventual creation of their papers. No conclusions can be drawn, therefore, as to the effectiveness of the program to generate ideas in the actual composing process.

Two studies done on computer assisted programs to help children handle structural elements of the composing process were carried out by Earl Woodruff, Carl Bereiter, and Marlene Scardamalia. Unfortunately what appear to be faulty assumptions about the composition process and the subjects' lack of experience in typing and word processing resulted in the creation of ineffective programs on the one hand and inconclusive results on the other. The first study concluded that the program was deemed "not to actually have engaged the students in a higher-level consideration of the composition choices" but resulted in students taking a "what next?" approach to their planning. [16] The second study,

which continually interrupted the students as they composed to ask them response-sensitive questions designed to "foster more carefully considered and more fully developed essays," resulted in work which received lower ratings. [17] Writers in the act of composing are bound to be disturbed, it would seem, by questions, no matter how well intentioned. The encounter with this new strategy, while long enough to show its ineffectiveness, was too short, even if it had been a pedagogically sound one, to show improved written work. The ability to master new strategies may be a much slower process than researchers realize.

Research into the possible effects of word processing on writers and writing is currently being carried out at the University of Minnesota. The project, a three year plan, is looking at the composing process of writers and the pedagogical implementation of word processing in the context of the classroom. Results, however, are not yet available.

Studies on the effects of word processing with computers on children's writing are currently being carried out at Teachers College, Columbia University, by Colette Daiute. Her preliminary evidence suggests that word processing improves the quantity of writing, the number of revisions, and the length of the manuscripts done by children. [18] These findings, while in themselves insufficient evidence to conclude that the computer has affected the quality of the end product, lend support to that possibility. Studies on the composing process, especially revision, highlight the relationship between revision strategies and the quality of writing. It is probably axiomatic that for real revision to take place, a piece of writing must have substance to it, a certain length. It is easier to revise a longer piece; there is more that can be deleted or rearranged.

Ellen Nold, who discusses the importance of the revision process states that "recent research indicates that one of the major differences between skilled adult writers and unskilled adult writers is the way they revise." [19] Citing Nancy Sommers' work on revising, she says that skilled adults revise globally first and then locally. [20] She makes reference to Beach's suggestion that the sophistication of a writer's revising strategies would be a good indication of the developmental level of the writer. [21]

Using the computer to word process, however, is not without its problems. There seem to be frustrations in learning any word processing program. It takes a period of time before the computer becomes for the writer an extension of his or her body in the same way as the pen usually is. It is possible, while one is learning a word processing program, to get snared in the web of its procedures and to lose important ideas and concentration, disturbing the rhythm and flow of the writing at hand.

In addition to mechanical interruptions, there can be logistical ones. If the computer is located in the user room of a

school, there are the distractions inherent in the presence of others that may disturb the quiet concentration necessary for many writers. The writer may find he or she needs materials or sources that are not easily transported, such as dictionaries. The user room schedule may be inconvenient or the computers may be occupied when the writer wants to work. The computer may be "down" for repairs or for maintenance.

But most obstacles can be overcome. When the word processing program is mastered, many writers find that computers allow them to catch their idea flow faster and more efficiently than by pen. Once the idea has been captured, one of the great advantages the word processor represents to the writer over the pen is its ability to delete, to insert, and to move small or large chunks of information easily. Revision can be done swiftly. As one professional writer put it, "It takes the pain out of writing." The ease of revision encourages writers to go back over their work again and again, making words more effective, sentences more powerful, paragraphs more unified. One of the many questions that needs to be looked at more carefully is whether revision done on computers remains the same as might be expected from the writer's developmental level or if the process of writing on the computer facilitates the acquisition of more sophisticated techniques. This is important since improved revision strategies should result in improved writing.

The use of text editors to help writers, after they have word processed their writing, to eliminate errors of grammar and spelling, improve word choice and usage, even to point out organizational matters, is a way the computer is being used as an editing tool. One of the most extensive programs of this nature, developed at Bell Laboratories, is called the Writer's Workbench. These programs may be used by the writer to highlight potential problems. Given the highly complex nature of language, the computer will not always be right, however, and the writer makes the decision whether to change a feature or leave it alone. Conclusions to trials conducted by Bell Labs suggest their programs may result in improved writing. "Compared to first drafts, the last drafts of documents had fewer passive sentences, fewer abstract words, and fewer awkward or wordy phrases." [22] However, no control group was used. Without a control group it becomes impossible to know how much of the improvement on the final drafts is attributable to the programs and how much to the writer's own skill at editing. Most writers' final drafts will be a noticeable improvement over their first, even without a text editor. While these programs appear to be valuable aids to the writer, more research needs to be carried out which shows the exact nature of advantages and disadvantages in using them.

The composing process via computer may also affect a writer's style. Assessing style, "style in the sense of what is distinguished and distinguishing," as William Strunk and E.B. White put it, is difficult.

> Here we leave solid ground. Who can confidently say what ignites a certain combination of words, causing them to explode in the mind?...These are high mysteries. ...There is no satisfactory explanation of style. [23]

These difficulties of assessment suggest that comparing changes in a writer's style writing on and off the computer may not be made easily with any sense of objectivity. It seems likely such changes as well as other changes in the written product do occur although we may not achieve a good understanding of them for some time to come.

What is the future of the computer in the teaching of writing? In spite of the recent wave of enthusiasm which is greeting the computer in education, there are notes of caution. Alfred Bork states,

> It is not clear that the computer is going to improve education. The computer, like any new technology, has the potential for improving education or weakening education....the computer is a gift of fire. [24]

If we resolve the Great Writing Debate and the Great Computer Debate and agree that for teaching writing the computer is best used holistically as a tool rather than as a drill and practice instrument, the debates will still not be ended. The question of how the composing process is affected using the computer is a complex one, not readily answered. Work in the area of computers and writing needs to take into account the ongoing research on the writing process. Both teachers and researchers need to have a solid theoretical foundation on which to build their strategies and approaches for using the computer as a writing tool. Then, tempering our enthusiasm with a touch of caution, we should attempt to discover through research and personal experience the best educational implementations of this exciting new writing tool.

NOTES

[1]Seymour Papert, Mindstorms: Children, Computers and Powerful Ideas (New York: Basic Books, 1980), pp. 30-31.

[2]James Collins, "Speaking, Writing, and Teaching for Meaning," Exploring Speaking-Writing Relationships, ed. Barry M. Kroll and Roberta J. Vann (Urbana, IL: NCTE, 1981), p. 201.

[3]Anthony Petrosky, "Grammar Instruction," English Journal, 66 (December 1977), pp. 86-88.

[4]Sondra Perl, "The Composing Processes of Unskilled College Writers," Research in the Teaching of English, (December 1979), p. 109.

[5]Sondra Perl, "Understanding Composing," College Composition and Communication, (December 1980).

[6]Linda Flower and John Hayes, "Plans that Guide the Composing Process," in Writing: The Nature, Development and Teaching of Written Communication, Vol. 2, ed. Karl H. Frederiksen and Joseph F. Dominic (Hillsdale, NJ: Lawrence Erlbaum, 1981), p. 51.

[7]Flower and Hayes, "Plans," p. 51.

[8]Janet Emig, "Writing as a Mode of Learning," College Compositions and Communication, 28 (1977), pp. 122-128.

[9]Petrosky, "Grammar," p. 88.

[10]Emig, "Writing," p. 128.

[11]Walter J. Ong, "Transformations of the Word," in Interfaces of the Word (Ithaca, NY: Cornell University Press, 1977), p. 17.

[12]Ong, "Transformations," p. 17.

[13]Jack Goody and Ian Watt, "The Consequences of Literacy," in Literacy in Traditional Societies, ed. Jack Goody (Cambridge, England: Cambridge Univ. Press, 1968), p. 55.

[14]Hugh L. Burns and George H. Culp, "Stimulating Invention in English Composition Through Computer-Assisted Instruction, Educational Technology, 20, 8, p. 5. ERIC EJ 232 548.

[15]Burns and Culp, "Stimulating Invention," p. 9.

[16]Earl Woodruff, Carl Bereiter and Marlene Scardamalia, "On the Road to Computer Assisted Compositions," Journal of Educational Technology Systems, 10, 2 (1981-82), p. 141.

[17]Woodruff, Bereiter and Scardamalia, p. 142.

[18]Colette Daiute, "Word Processing," Electronic Learning, (March/April 1982), pp. 29-31.

[19]Ellen Nold, "Revising," in Writing, Vol. 2, ed. Carl H. Frederiksen and Joseph F. Dominic (Hillsdale, NJ: Lawrence Erlbaum, 1981), p. 67.

[20]Nold, "Revising," p. 67, citing N. Sommers, "Revision Strategies of Experienced Writers and Student Writers," MLA, December 1978.

[21]Nold, "Revising," p. 67, citing R. Beach, "Self-Evaluation Strategies of Extensive Revisers and Nonrevisers, College Composition and Communication, 27 (1976), 160-164.

[22]Nina H. MacDonald et al., "The Writer's Workbench," TEEE Transactions on Communications, Com. 30, No. 1 (1982), p. 109.

[23]William J. Strunk and E.B. White, The Elements of Style, Third Edition (New York: MacMillan, 1979), p. 66.

[24]Alfred Bork, "Reactions," in Computers in Composition Instruction, ed. Joseph Lawlor (Los Alamitos, CA: SWRL Educational Research and Development, 1982) p. 73.

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